Wrap-Up Session - Where Do We Go From Here?

Fagergren: I again have the honor of being here: I gave the starting comments and I get to give the closing comments. I think the turn out for this session is a testimony to the dedication of people that are still here.

I hope that the conference has been very worthwhile. I'm very thankful that you all came for whatever length of time you could be here and that some of you are still here.

We will have Jan Newton present the student awards and then we're going to run through a very quick session presenting the interpretation or perspective of different people that have been involved with this conference, and for some of them, many of the research conferences that we've had on Puget Sound. They'll compare this conference to previous conferences; talk about issues that are either in common or new, and discuss a bit about where we go from here.

With that I'll turn it over to Jan and let her give the awards for the student papers.

Newton: I don't think there's much that's more fun than seeing the next wave of good minds come in and recognizing how they're going to bring us into the future. Last night, a friend of mine, actually he works with me, but he's also a friend, Skip Albertson, said a quip, and I think I have it right. He said, 'Freshmen are the ones who come in and bring in new knowledge to an institution and seniors are the ones who leave it there.' I think we've seen, in this meeting, an awful lot of high quality presentations from some students. Some very innovative thoughts. Some very high quality methods of presenting things. Another colleague said, 'Yes, you can tell the student talks because they're the ones you can hear and you can see the good slides and all of that.'

The process in evaluating the student presentations is really difficult because, first of all, there were a lot of them. We had twenty student presentations; ten graduate talks, three undergraduate talks, and seven or eight posters, I'm not sure of the tally there. That's a lot of presentations and as you know there's a lot that goes into scoring a presentation, some of it very subjective. In order to do this we used score sheets that had different categories about clarity, content and presentation, etc. There were numerous anonymous judges in the audience, secretly going around and listening to these talks and looking at these posters and talking with the students and keeping track of them.

I have all of the evaluation sheets that we received from the judges. We're going to give these to the students so each student should get a handful of these evaluations to provide them some information about how their presentation or poster was received. It's a lot more informative than knowing "I won" or "I didn't win." Students will get to see the opinions and the comments of the judges about their talks, the suggestions that were made, and the diversity of opinions that are out there.

Something that we really wrestle with is that sometimes there are no clear winners. People have different opinions and I should say that the judges came from a wide variety of backgrounds. From academia, management, education, etc. I will get down to the really important stuff, but before I do that, I want to thank all of the judges.

We're giving awards in three categories: posters, graduate talks, and undergraduate talks. Each student who wins will get a certificate and a check. I'm going to tell you the winners and the runners up because, as I said, it was really hard to score some of these.

We had seven student posters. The winner of the best student poster is Casimir Rice. It doesn't look like Casimir is here. The runner up is Kyle Ren from the University of Washington and third place is Wendy Simms from the Institute of Ocean Sciences.

We had three undergraduate talks that were very difficult to rank. The winner is Tim Crone. Second place is Lisa Nguyen and the third place is Ken Prentice.

Finally, we come to the category that was the hardest to score. The winner for the best graduate talk is Kelly Curtis. For second place, we had a tie, and it's kind of ironic because they were both speaking on

similar topics. Both of them spoke on climate impacts on organisms, and those people are Bill Pinnix and Beth Bornhold. The third place presentation is Brian Haug.

Fagergren: Now, I'd like John Armstrong, being the historian he is, to give his perspective on how we may have plowed new ground or learned new things through this conference or how this compares to what we've seen in the past.

Armstrong: I don't know if I'm comfortable with this historian role, but no one else wanted to do it. I decided what I'd try to do is go over some of the major issues since the mid-1970s. And I thought, well, the way to look at that would be to go back to the past research conferences. The first one I went to was in 1977 called "Use, Study, and Management of Puget Sound" held at the University of Washington. I picked up those proceedings and thought I'd pick out a paper to show how far we've come since 1977. I'd ask you if you'd agree that this paper wouldn't be relevant today because we've gone beyond that: Brian Mar at the University of Washington gave a paper on "Muddling Through the Management of Puget Sound." Probably, he could give that same paper today, 20 years later, although we've tried a lot of things since then.

I thought what might be useful is to really quickly go over some of the major programs, and initiatives, and issues that I've seen over these 20 years. For the folks who've been around that long and longer, maybe it'll remind you of some of the things you've worked on, some of the big issues that came along. For those of you that are newer here, I think you'll be amazed that, even though I'm going to just cover what is a brief list of these things, there's an awful lot that's gone on in Puget Sound as far a science and management in the last 20 years.

The ones I won't mention, because they would come up every year throughout the 20 years, are habitat loss and population growth. Every year we talk about that and every year it seems to get worse.

- When I first started, there were the Metro interim studies, looking at effects of Metro's outfalls on Puget Sound.
- NOAA was starting to fund work in the Strait of Juan de Fuca and the Puget Sound, oil transport related biological studies, the MESA one was looking at various things in Puget Sound, many studies.
- The Boldt decision came, giving the tribes rights to salmon.
- Liver lesions were shown in flatfish around Puget Sound. The whole issue of toxins became bigger and the newspaper printed pictures of hotspots in the urban bays, mainly.
- We start seeing heavy harvest of nonregulated invertebrates and seaweed.
- A decision was made by the Department of Ecology and EPA that all the treatment plants in Puget Sound had to go to secondary treatment.
- There was a big odor problem in West Seattle with rotting seaweed.
- Superfund came along. Commencement Bay became a Superfund site. Now we've got Harbor Island, Sinclair Inlet, Eagle Harbor.
- Some dead whales were found in the Sound; this elevated environmental issues even more.
- The Puget Sound Water Quality Authority was formed.
- Seaweed was looked into, a lot of money went into that, but it never took off.
- Mussel culture was tried. I can't go into a restaurant now without finding Penn Cove mussels somewhere.
- EPA started getting money for Puget Sound with its National Estuary Program and has funded a lot of studies over the years.

- There were South Sound studies back in the mid-1980s, we just heard about some Budd Inlet studies at this conference. There were Budd Inlet studies then, and also studies in the South Sound looking at potential discharge zones.
- Urban bay studies were done in the mid- and late 1980s concentrating on toxins in the urban bays. We had a lot of fishing advisories in those days. I first became aware of those when there was Greenpeace sign on the waterfront in Seattle with my phone number on it as a contact – quite surprising to me – and then King County replaced those a week later because they didn't want to be upstaged by Greenpeace.
- There were lots of Puget Sound reconnaisance studies going around the Sound looking at what were the sediment conditions and the contaminant levels and fish and seaweed and so on.
- Victoria sewage came up and talks about boycotting Victoria. That issue isn't dead yet.
- Mustard gas – there was talk that the U.S. dumped mustard gas at the Strait of Juan de Fuca mouth years ago. No one ever found it though.
- Sea Grant came out with a series of books on Puget Sound.
- Ecology came out with state sediment standards.
- The Puget Sound Ambient Monitoring Program began.
- There was a Puget Sound Conference in Washington, D.C., of all places. Several of us went back to that one.
- There was clam scam: geoducks were illegally harvested. One year we talked about that.
- Herschel taking steelhead at the locks. How many years and how many hundreds of thousands of dollars were spent on that?
- Canadians did some studies, Burrard Inlet studies at Vancouver and Fraser River Estuary studies.
- Harbor seal were shown to be the source of some contaminated shellfish beds in Hood Canal. The way we solved that is we built floats so that the harbor seals would go out and go on the floats instead of on the shore where the clams were.
- The Renton outfall studies; more Metro work.
- Boldt Two came along recognizing the tribes right to shellfish.
- Pacific Marine Environmental Laboratory, an arm of NOAA, stopped doing work in Puget Sound.
- Padilla Bay became a National Estuarine Research Reserve.
- There were studies of the impacts of aquaculture of salmon. Harmful algal blooms then killed a lot of those salmon.
- There was an oil spill in the Strait of Georgia.
- Exotic species in Puget Sound, like *Spartina*, started to be discussed a little bit.
- Juvenile salmon were shown to take up contaminants in rivers.
- The watershed approach became big. This was maybe five years ago. We hear a lot everyday now about the watershed approach.
- We had an agreement between Washington and British Columbia to work on environmental issues and this Puget Sound Georgia Basin Task Force that you heard about at this conference was formed.
- More Budd Inlet studies.
- Atlantic salmon escaped last summer.
- Salmon wars with Canada.

- Exotic species really becoming a big issue now.
- Depressed stocks. We've talked about this over the years. Not many are getting better.
- Marine protected areas are getting popular. Several people mentioned those at this conference.
- PRISM, the UW is starting to try to do more of a concerted, coordinated effort in Puget Sound.
- Endangered Species Act.
- Fish and Wildlife Department – we get the exotic species act and chinook salmon issues and the Department of Fish and Wildlife's funding starts going down.
- Lately, Sea Grant, which published books a long time ago, came out with a CD-ROM on Puget Sound.

This list could go on and on and on. It's just amazing to me when I start thinking back how many issues and projects all of us here and others worked on in the Sound. I guess my conclusion is simple. It's that it's an interesting and rewarding thing to work on understanding and protecting Puget Sound. It's also always going to be a full time job. That's my quick history of the last 20 years.

Fagergren: Curt Ebbesmeyer, would you give your perspective, and then maybe Jan following you, and then Shari.

Ebbesmeyer: Thanks, Duane. I've been around a little longer than John. I remember the days when the Office of Naval Research was the main funder of Puget Sound oceanography, and that was in the 1960s. If you weren't on the Navy funding, you didn't have much to do. That carried through to the mid 1960s, and then West Point kicked in and we got the sewage out of Lake Washington.

What impresses me most about this particular conference is the sheer volume of money being spent on oceanography. It's just enormous. You have a really intensive, first-rate program in the Duwamish. We're not using simple models anymore. The Duwamish Project that Randy Shuman is running is sucking up a significant amount of Boeing Cray time; that's pretty impressive. In Budd Inlet, we're using a similar kind of model, but we haven't tapped into Boeing yet. But the models are being applied are state-of-the-art, Cray level type models, not just in one or two places, but around the Sound. Budd Inlet is a couple of million dollars of oceanography. The UW PRISM effort is a few million spent over a number of years. The Denny Way CSO Program was half a million in oceanography. The Elliott Bay Restoration Program was a half a million. The Hylebos investigation is going on now. There's probably a million or so. If you add up all the pieces, there's several million every year going to understand the oceanography, and I'm just looking at the physical aspects.

Where do we go from here? I still maintain that Puget Sound is dying the death of a thousand cuts. There's no way of looking at what is really happening, overall, to the Sound. I still think it's like the client on the operating table and we're all a bunch of surgeons. We run and we make our little cut and we go out and nobody's coordinating all these surgeons. I think the patient is kind of sitting there and not doing too well, and we're all kind of, maybe, happy, and we all leave the room and the client dies. I don't think that's very good service. I'm still looking for a way to manage overall Puget Sound so we have all this coordinated so that when somebody does something in one little bay, we know what its overall impact is going to be. I'm very optimistic. We're just lacking that overall coordination tool.

Newton: What Duane asked for is several people's perspectives on what they really learned from this conference. What are your take-home impressions or lessons? So I thought up two, and since I have two minutes, I'll take a minute each. One has to do less with science than it does with the way we're doing science. Similar to what Curt just said, I think one thing that impresses me and actually gives me a lot of hope for the future is seeing some programs coming together and working together. I see PRISM excited to work with PSAMP. I see Canadians excited to work with the U.S., and maybe we're not where we really need to be, but I think we're making a lot of progress that perhaps we weren't making as much before.

I guess I'm a bit more encouraged than Curt in that I do see some larger regional scale studies starting to happen. Department of Ecology is making a commitment, at least in the planning stages, of looking at nutrients in all of south Puget Sound. The program with Metro King County that Randy is heading up is looking at siting wastewater treatment plants and they're looking at central Puget Sound as a whole. I think that we really need to keep going in this direction because I agree with Curt that we could let the system die the death from a thousand cuts. So that's my first observation, and it's quite an optimistic one that we can start to make some progress, though, as we know, it's not easy and it's not cheap either.

The second thing is a scientific observation. I think one thing that I'm exited to see is people looking at the system and looking at it as a system as a whole in the sense of, you saw a lot of talks that were looking at climate impacts on biological systems. I think, all too often, we were looking at our little parcel of water, our little beach, and we weren't really taking into account the fact of interannual climate impacts. I'll mention the two student talks, Bill Pinnix' and Beth Bornhold's on how interdecadal climate variations are changing some biological stocks. I think those are the things we really need to keep tabs on. The impacts of El Nino, a subject near and dear to my heart. Those kinds of things are important so that we can be able to separate out what's coming from humans and what's coming from the natural system itself. Thank you.

Schaftlein: Hi, my name is Shari Schaftlein. I work for the Washington Department of Transportation and manage our environmental initiatives and water quality program. As a DOT employee, I want to thank you for staying this late and let you now that you are all going to be stuck in congestion. But I'd be happy to give you a free coupon to drive your SOV in the HOV, so you can see me afterwards about that.

I'm supposed to represent the typical manager and kind of give you a response on how I would apply what I heard over the past couple of days. In our department we probably spend about a million dollars a week on mitigation and analysis with about a hundred million dollar budget over a biennium. We've got about $1.5 billion of construction going on over a biennium. About 30 EIS's at any one point in time. A couple hundred projects and 20 year long range planning going on. So, I need your data, I need it now, and I need it to help affect decisions and moneys that are being spent.

I want to share with you some perspectives of trying to be a translator between the science and the policy makers, particularly in a large department like DOT, which would be reflective of many public works or large development folks. You deal with some issues such as your manager saying, 'I watched a show about fish in Alaska last week, their fish seem to be able to jump really high. Why do we have to fix our fish passage problem in Washington State? Can't our fish just jump higher like the one in Alaska?' And you start seeing the interdisciplinary gap between environmental science and civil engineering. To take it a step further in terms of analysis, I've worked on a value engineering team with a geotechnical engineer who complained to me as an environmental scientist, 'You know, you all aren't very credible. Your science keeps changing. You keep changing what you're evaluating. You don't know whether what you do works, etc., etc. I had to defend my profession and remind him about how long we have been building roads and building bridges. Since Roman times, before Roman times? How big of a budget does the U.S. government put into analyzing every conceivable thing you'd want to know about asphalt and concrete? And the budget just soars compared to what federal highway officials spend on environmental research. And I reminded him that our science was only about 20 years old and that there are incredible variables to deal with, and we are working with issues that don't lend themselves to complete mathematical models that are solvable. We can't deal with everything in a lab like you can with geotechnical engineering.

So how have I been listening to the results presented at this conference? I'm listening to hear if the results conclusive. Will I spend money differently? Do the results represent additive information? Are the folks presenting this in a way that tells me, "Here's step one and that will lead to something in the future." Have you ruled out an option for me or narrowed my choices? Is it just pure research? Tell me what it is so I know how to fit it in, in terms of making a management decision?

I'm also reminding folks that we have a very large research budget and call help fill in the gaps of

research that needs to be done, if it's done in an applied way.

I certainly wanted to congratulate the folks who presented their presentation in the form of: "here's what I'm going to tell you; here's how you will use this data; here's how decisions will be made; here's what my customers thought about the research."

I feel very positive about the results of the conference. We tried to set it up and encouraged the authors to describe next steps and apply it to policy perspectives, and I think we accomplished that and I talked to a number of people who felt that that was a benefit of this conference in describing what their research meant in terms of policy and management decisions. I think the next steps in terms of what we have to look forward to in the future are rolling up the data to support prioritization. There was progress in that. There was progress in large-scale ecosystems analysis. Folks have complained that don't do cumulative impacts analysis at our department. Well, we can't do it if no one else has done it to help affect how we're going to develop our transportation system.

We need cost-benefit data, most importantly. We're trying to figure out how we take limited resources and distribute them to whatever the priority problem is. That's a big debate right now. When I'm advocating for resources in my department, I'm going up against people who say, "Well, we need to do this safety improvement because 14 lives will be saved and X number of products will get to the port quicker, and all that means that six million dollars of benefits will exist for this one million of cost. Shari, how much benefit is there for that fish passage? How much benefit is there for that stormwater retrofit, etc." And I just have to say well, it costs X million and it's really important and people feel good about it. You're kind of limited in competing right now when you try to go up against cost-benefit analysis in a department that's trying to shift to that. I think other departments are having that same kind of experience right now. As we evolve and look at what we include, I think cost-benefit analysis will help us tremendously.

I want to show a graphic now, and ask you all to think about, did the science that you have heard over the past couple days get reflected? The legislature just ended at 10:30 last night and has set in motion a number of policy actions and budgets to try to attempt to deal with what we've been talking about here today. I wanted to highlight the results and share with you some of the moneys and ask you to review this legislation. Think about whether your research results are represented.

When you take your 25-page paper and squeeze it down into an executive summary and squeeze it down in a paragraph and share it with a legislator and see it end up in a bill, you might be appalled. And you might be appalled when you take your research and cram it into something and give it to your policy wonk and have them explain it to the legislature and see what kind of questions get asked, you might get appalled. Science does somewhat get lost in our public policy debates.

With House bill 2514, we have a watershed-management-planning bill in this state right now. Did the science get reflected? I think, definitely. There was much debate over just having a water quantity bill, and many people worked very hard to try to get the option, at least, to include water quality and habitat in that bill. So, we're making progress with that concept. And I think there's about five million dollars going into that to go out to locals and 14 staff at Ecology to provide technical assistance.

Wetland mitigation. It was certainly recognized by the legislature that we've got to move mitigation banking, and they put some language together to try to move that forward in a consistent way around the state, and the legislature is backing that and expecting reports on how well we are doing to get that implemented.

Advanced mitigation. The legislature put in two million dollars in our account for us to start doing mitigation in advance of a project. So, for example, if we add a lane to I-5 down to Portland, and in the Chehalis basin we might create a wetland bank now, years in advance of that project happening, a big huge bank for all the little bitty impacts we're going to have. That would make ecological sense. We've got the moneys to do that and some authorities to do that now. And the legislature has promised about another 20 million dollars to support this over the next six years.

On fish enhancement and permit streamlining, the legislature put in over five million dollars to fix fish passage on non state roads and an additional half million dollars on state roads and looked at permit streamlining. How do we get these projects on the ground quicker?

Finally, the salmon recovery-planning bill passed as well. And a lot of science evolved into that discussion as well. There was a science advisory team included in that, which should be one of the bullet points there listed. To have an independent science, to make sure we're covering salmon in a scientifically legitimate way.

I think put in a little over 20 million dollars to go to on the ground projects for restoration. So all the work that we heard today on projects, there's money there to start doing it in a prioritized manner.

It was kind of comical to hear the legislature talk about critical path thinking. They could come up with some of these science concepts and see it to the end.

So I think there was tremendous progress, and a lot of things that we were talking about made it into these bills, and I would ask the scientists and folks in this room to recognize that all these bills, and many others that we couldn't list here, have technical advisory committees and what-not, where we need to get the science working with the policy and get it implemented. And certainly, as Jan mentioned, this is requiring a lot of interdisciplinary work when we start doing tradeoff analysis and prioritizing within a watershed.

Fagergren: Bill Pinnix, would you mind stepping to the mike and giving your perspective, and Tom Putnam, if you would follow him and give a minute or two, I'd appreciate it.

Pinnix: Duane asked me to give my feelings, as a student, on this conference. After the panel, I'm not sure what I have to say other than what I saw here was a big step forward (at least in my mind, having not been to a Puget Sound Research Conference before), but a step forward in interdisciplinary research, or conferences that bring people from very different scales of the scientific community: from management to biology to large scale systems into the same conference to speak about a shared resource.

I've been very privileged to work in an interdisciplinary research group at the University of Washington looking at the effects of climate impacts on the Pacific Northwest. The research that I do concerning salmon, I could not do alone. I couldn't do as a fisheries biologist. I'd still be doing histology of salmon ovaries, had I not been in this group. I've learned an immense amount of knowledge that is stored in other aspects of science.

And not only de we learn what other scientists are learning, but we learn new methods of analyzing old data. A lot of what I do is take data that has been collected for the last 30 to 40 years and re-analyze them with new techniques, and lo and behold, patterns emerge that people have not been able to see before. So I think that this type of forum is extremely useful for educating, not only scientists and managers, but that we can take this education to the community and help educate others.

My only suggestion is that these happen more often than every two or three years. I'd like to see these happen every six months. I'm sure not a lot of research can be done that fast, but there's a lot more out there. Thank you.

Putnam: I'm Tom Putnam. I'm on the Puget Sound Council, which has turned out to be kind of a nexus point for trying to implement some of the decisions and the things that are going on in science. This is the fourth Puget Sound reserach conference I've been to.

I've noticed the fulfillment of a lot of the original ideas that were talked about back in the early 1980's. We were talking then about what would it be like to talk about a watershed. What's a watershed? What's an ecosystem? What would it be like to manage based on these concepts? For me it's really exciting in the last couple of days to see studies that reflect these concepts. We're now getting data based on research based on these concepts which may seem pretty basic, and it may seem we're not as far along as we should be, but it's a lot of progress in the last 12 or 14 years.

The lack of data, for a lot of things, has been an excuse not to act. We don't know if fish stocks are really crashing, We don't know what's going on. That's been an excuse not to act. Now, we're getting data. We're getting the basis to go ahead and act which I think I'm also seeing a little more confidence on the part of scientists and people doing these studies and a little more willingness to participate and to

suggest and say, 'This is what we ought to do.' I think science is traditionally more reserved, has been more reserved. I'm really encouraged to see people coming forward and working on these issues and doing that.

I'm also very impressed by technological refinements. I make films for a living, among other things, and I made a film about Puget Sound in 1990, and I was trying to visualize a lot of the stuff that was going on then about dynamic models and layering of GIS data and integrating things; the PSAMP data, and things like that. It's really exciting to see PRISM and some of the other ways that we're beginning to visualize. I think that is one of the most important things, and that's where we go from here. We go out from our circle of science and policy and offices, and we go out to the public with this and we let them understand what is at stake and the dynamics, and we get them out there in nature and on the water and see the fish and the birds and what an incredible place we live in. Thanks.

Fagergren: Thanks, Tom. Jacques White from People for Puget Sound. Would you like to say few words?

White: First of all I'd like to thank the Puget Sound Water Quality Action Team and the Advisory Committee for putting together a really good conference. I'd like to give the unofficial energizer award to Jan Newton for participating, I think, directly in at least five sessions, either as a panelist, a speaker, or a moderator. I think that you all should pat yourselves on the back a little bit.

This is my first Puget Sound Research Conference. I came here from the Chesapeake Bay Region where I was a research scientist, and they put together a similar meeting like this, and I don't think it was any bit better in terms of quality, in terms of quantity of material, in terms of the creativity that I'm seeing, and in terms of direct addressing of some serious problems that they have. They do the kind of work that they do there, at least from their funding from the EPA, on about 20 to 40 times as much as the money that you guys get, and you're doing quite a bit of good work. If I've ever heard a reason or a justification for getting more resources here to continue the good work you're doing, I think that that is an indication of it. With that said, I think I have a couple of comments that will echo some of the comments that were made by the earlier speakers.

I definitely agree with some of the things that Shari said. I think there are some challenges that are before us. Everything that I see right now through my work for People for Puget Sound and habitat restoration is kind of focus through salmon goggles, and that focus is intensifying. So the things that I say are going to be related to that.

At the conference, I heard that the National Marine Fisheries Service and EPA are going to work together to unify requirements for ESA and the Clean Water Act to streamline the need for permits for users. I would like to compare that statement to evidence that was not presented here, but that the EPA is lowering cleanup requirements for PCBs in Commencement Bay, on the one hand, and on the other hand, NOAA scientists at the meeting today presented information that there's significant contamination of salmon and other resources in Commencement Bay systems. So what I learned is that National Marine Fisheries Service and EPA coordination to protect fish and water quality has not yet happened, and my message to you all is, 'Please help, if you can.' If you can figure out a way to make that move that forward that would be a really good thing.

The other issue echoes directly some of the things that Shari said. What I didn't learn is how to carry out a limiting factors analysis for salmon in an entire watershed that will allow us to prioritize restoration projects and make realistic estimates of current and projected system carrying capacity. Notice that I didn't say, result in more fish. There are other factors besides habitat – climate conditions, harvest, and hatcheries – that also impact fish. But we don't have a good idea of how to directly go from a restoration project or a number of restoration projects to a number of increased carrying capacity for our watersheds. As we think about spending millions and millions and millions of dollars on restoration, that that's something that we need to do. So I would suggest that we get to work on developing a methodology to do cost-benefit analysis that indicate, not only the economic cost effectiveness of a given restoration action, but also maximizes benefits to total ecosystem services to fish and other natural

resources for a given project. I realize I'm not asking for much, but those are my comments. Thank you very much.

Fagergren: Tim Ransom, do you have a statement to make?

Ransom: Just a couple of comments. The first being that if Mr. Pinnix wants to see this every six months, he should come talk to Dave Sale and then me about what it takes to do this. I want to point out that Dave and his crew, Joanie Pop, Scott Redman, Jan, did all this for us, and having done it twice myself, I do have a certain perspective to that.

I have a comment on the quality of graphics on the screen, but I'm not going to go into that right now because I'm too tired. I'll simply point out that the best graphics I saw, and the best talks, in terms of technique, that I heard, were given by students, and I think that's a wonderful sign.

Secondly, just as an overview, I remember in 1991, I believe it was, the first conference, there were a lot of talks about individual species, and we all came away from that conference saying, we've got to think systems. And that's what everybody went and did for the next four or five years and we got into the watershed process. And that worked for a while and it developed other kinds of larger system processes. We're now back to thinking species in the future. We can now be talking about fish and I challenge us to think about how that is going to drive us for the next three years until the year 2001 when we're going to be here again, or somewhere like it, asking ourselves these same questions. Thanks.

Fagergren: It's my understanding that Kelly Curtis, who is the graduate award winner, is now here and so is Beth Bornhold, who was second in a tie with Bill. Could you please stand and be recognized. And Kelly, we have the award here if you'd like to come get it after we're finished. I would really appreciate if someone, whether it's Beth, or someone else from our good friends from Canada come forward and say something from their perspective coming down here. We really try to bill this as a Puget Sound/Strait of Georgia Conference. We really appreciate the many very good papers presented by Canadian researchers. I'd really appreciate it if someone would come forward and say something.

Bornhold: I was kind of hoping I wasn't going to be noticed, but I guess somebody saw me sitting there. I was really excited to come up here and to hear what was being done in Puget Sound. I knew a little bit about what was being done in Strait of Georgia from my own work, but it was really good to hear all the similar work that's being done in Puget Sound, and to hear how the future looks towards the Canadians and the Americans working together, because I think we are doing a lot of similar work. The two basins aren't separated. I mean there is an international border there, but the water doesn't see that, so I think it's really important to continue to look across that border and to work together. And that's really what I got out of the conference was seeing that, so hopefully we'll continue to do that.

Fagergren: Thank you very much, Beth. Tim, I appreciate you thanking Dave. I wanted to have the last word to thank Dave for all the hard work he's done, and Joanie Pop from Event Dynamics. Dave, if you want to say something, I think you have earned the right to say the last thing and then I think the conference is over. It's 5:00 and we wanted to get you out of here at 5:00.

Sale: Well I'll talk really briefly. As has been talked about at previous conferences, we discussed a wrap up session. In the past it's always been set aside because we've felt "Who's going to want to come to a session at 4:00 on a Friday afternoon? Everybody's going to want to go home.' We thought that we might get 20 or 30 people here. I think it says a lot about everyone here in this room, how many people are here. I think you owe yourselves a round of applause for sticking around.

One of the things that was really exciting for me about doing this was start with the individual abstracts as they came in and see all the pieces of work that are being done and to see them come together

as connections among them become clear. Sometimes that gets lost in talking about individual work.

One of the things we tried to bring across at this conference is that there are a lot of efforts going on right now to integrate our work: PSAMP or PRISM, the Georgia Basin Initiative, the Task Force across the border. I think that we really need to keep that sort of thing up. There's a lot of complexity to both the environmental and cultural systems around here, but it doesn't mean that we can't get at the problem. Thanks a lot for coming.